

Behavioral Authentication and Video Player Framework

This master project is generally concerned with behavior analysis. There are two independent topics that can be addressed:

1. User authentication based on behavior recognition
2. Analysis of the video watching behavior on the e-learning platform with an unified Video Player Framework

Please find more detailed breakdown of the topics below.

Behavioral Authentication

Passwords are used for securing computer systems for a long time. Nevertheless people use short and weak passwords for their own accounts. To solve this problem, the Identity Management Lab of HPI is developing a system that does not rely on password but on human behavior, such as gait recognition. Our system in its current version can detect the gait of the user and determine the trust level, a probability that the user is also the owner. This trust level can be send to other systems as authentication criteria. To increase the reliability and security more features or devices needs to be added. So, it will be harder to hack the system with a copy of behavior.

Goals

Development of new methods for behavioral authentication. There are some examples:

1. Development of a gait recognition system using fixed or mobile cameras
 - Using video information to detect the gait of a user
 - Using different machine learning methods to get the best gait recognition result
2. Development of a system that identifies and authenticates persons using surrounding sounds
 - Evaluate how different background sounds can be used to identify users
 - Analyze the frequency and sound volume of keyboard dynamics

Development of a Video Player Framework for E-Learning Platforms

HPI is developer and provider of several e-learning platforms such as tele-TASK, openHPI, mooc.house, openSAP, and OpenWHO. The focus is on video-based learning targeting thousands of learners. To be able to understand and improve learning it is important to also analyze the video watching behavior. The e-learning platforms use an HTML5-based video player. But as time went by, more and more platform-specific adaptations and functional additions were made, but mostly not shared within the other platform's version. So, the two main branches differed apart from each other.

Goals

Development of a video player framework for openHPI, tele-TASK and future projects. There are some tasks:

- Develop and implement a common base framework with a unified feature set
- Event-based analytics module based on the approaches already done in openHPI and tele-TASK
- Depending on team size and previous knowledge: development of player components for integration in native apps for iOS, Android, Windows (UWP)

Supervisors

Prof. Dr. Christoph Meinel

Philipp Berger, Christian Tietz, Matthias Bauer, Martin Malchow, Jan Renz, Tobias Rohloff
...@hpi.de